Ethnicity and the Dementias

2009-2010

Stanford Geriatric Education Center

Webinar Series
Estimated Number of People with Dementia Worldwide

- 2010: 35.6 millions
- 2030: 65.7 millions
- 2050: 115.4 millions

Alzheimer’s Disease International, 2009
Prevalence of Dementia Increases with Westernization Worldwide

% dementia age 60+, 2001

Reference: Ferri CP, Prince M Global Prevalence of Dementia, a Delphi Consensus study Lancet 2005
Cross Cultural Studies Show Higher Incidence in US Compared to Country with Ethnic Similarity

- **Indianapolis-Ibadan Study**
  - 1.2

- **Honolulu Asia Aging Study**
  - 1.0

- Yoruba: 2.5
- African American: 2.5
- Japanese: 1.9
- Japanese-American: 1.9

Age standardized annual incidence (%)
US Population 65+ Will Become More Diverse Over the Next 50 Years

2003

17%
Latinos & Asians - fastest growing populations

2050

39%

State of Aging and Health, 2007
Ethnic Variations in Risk of Dementia in the U.S.

- Recent interest
- Few large scale studies
- Comparisons difficult due to different measures and methodologies
- Some major populations with no studies
African Americans have Higher Incidence Compared to White Groups in Most Studies.
Prevalence of Dementia among African Americans

3 Community Studies in the 1990s

- No. Carolina
  - NL White: 3
  - Af. Am.: 7
- Baltimore
  - NL White: 3.8
  - Af. Am.: 7.2
- No. Carolina
  - NL White: 7.2
  - Af. Am.: 16

Froelich, JAGS
Summary: African Americans

- Most, but not all, studies show higher rates of dementia in African Americans.
- Further research is needed.
Latino Americans- --
A Heterogeneous Category

- The term ‘Latino’ based on linguistic definition
- Encompasses: Caucasian, mestizo, mulatto.
- Genetic studies ➔ not uniform
- One label--Hispanic or Latino Americans
  Populations from many different Latin, South American, and Caribbean countries
Manhattan Study: Caribbean Latinos Had Higher Age-standardized Incidence Rates
Prevalence of Dementia
North Manhattan Study (N=1449)

Gurland et al., Nat. Research Council, 1997
SALSA Study
Sacramento Area Latino Study on Aging

- N = 1778 aged 60+
- 45% born in Mexico, 49% in US
- Mean years of education: 4.7 for Spanish speakers, 10.7 for English
- Overall dementia prevalence: 4.8%
- Risk 8x higher for those with diabetes and stroke

Haan et al., 2003
Summary: Latino Americans

Studies show, compared to non Latino White Americans

- Caribbean Latino Americans have higher rates
- Mexican Americans have similar rates
- Further research is needed
Japanese Americans Have Prevalence Similar to Whites

- Honolulu Asia Aging Study: 7.6%
- Kame Project: 6.3%

Prevalence rate (%)
Summary: Asian Americans

- Only studies on Japanese Americans, their rates similar to White
- Research is needed in other Asian groups
Few Small Studies on American Indians

- Cree Indians compared to White Canadians:
  - 0.5 age adjusted prevalence of Alzheimer’s compared to 3.5
- As Cherokee ancestry increased, the rate of Alzheimer’s decreased
What U.S. Populations Have Little or No Data?

- American Indians
- All Asian Americans except Japanese:
  - Chinese, Filipino, Korean
  - South Asian, Southeast Asian
- Middle Eastern
- Eastern European
Summary of Differences in Rates of Dementia

- Most studies find higher rates among African Americans than non Latino whites.
- Among Latinos, Caribbean elders have higher rates, but Mexican Americans seem to have similar rates as non Latino whites.
- The only Asian American population we know about is Japanese Americans, and they may have similar or slightly higher rates.
Race & Ethnic Differences in Rates of Dementia: Possible Explanations

- Measurement & Methodology Differences
- Genetic Differences
- Metabolic Risk Factors
- Educational Quality Differences
Race & Ethnic Differences in rates of Dementia
**Measurement**

- Standard instruments used to assess cognition often developed in White groups
- Some like the Folstein MMSE have been validated in several languages, but specific test questions do not work well for some populations
- Best way is to measure an individual using cognitive tests at more than one time and use the change in scores to inform diagnosis
- Certain tests like the Cognitive Assessment Screening Instrument (CASI) good for low literacy populations
Race & Ethnic Differences in rates of Dementia

Genetic Differences
Apolipoprotein E (ApoE-ε4)

- Apolipoprotein E comes in 3 forms (ε2, ε3, & ε4), and each person has two copies.
- E4 increases risk of Alzheimer’s Disease.
- % of population with e4 varies by ethnicity.
- The strength of the risk conferred by e4 allele presence also varies by ethnicity.
<table>
<thead>
<tr>
<th></th>
<th>4/4</th>
<th>3/4</th>
<th>2/4</th>
<th>2/2*</th>
<th>2/3</th>
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</thead>
<tbody>
<tr>
<td>Caucasian (n=11,369)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Clinic/Autopsy</td>
<td>14.9</td>
<td>3.2</td>
<td>2.6</td>
<td>0.6</td>
<td>0.6</td>
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<td>Population</td>
<td>12.5</td>
<td>2.7</td>
<td>1.2</td>
<td>1.2</td>
<td>0.6</td>
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<tr>
<td>African Am. (n=475)</td>
<td>5.7</td>
<td>1.1</td>
<td>1.8</td>
<td>2.4</td>
<td>0.6</td>
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<tr>
<td>Hispanic (n=528)</td>
<td>2.2</td>
<td>2.2</td>
<td>3.2</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>Japanese (n=2311)</td>
<td>33.1</td>
<td>5.6</td>
<td>2.4</td>
<td>1.1</td>
<td>0.9</td>
</tr>
</tbody>
</table>

*very small n’s
adapted from Ferrar, et al., JAMA, 1997
Race/Ethnic Differences in Risk of Dementia Due to Genetics?

- ApoE variations only apply to Alzheimer’s dementia, not vascular or other types.
- There is no consistent evidence that either African Americans or Latino Americans have a genetic variation that would make Alzheimer’s Disease (AD) more likely.
- Japanese Americans may have increased genetic susceptibility.
- Other genes may also be related to AD by race/ethnicity (e.g., Sortilin-related receptor SORL1).
Race & Ethnic Differences in Rates of Dementia

Metabolic Risk Factors
Metabolic risk factors

- Cardiovascular risk factors
- Diabetes
- Adiposity/obesity
Cardiovascular Risk Factors

- Recent review
  - Single Cardiovascular Risk factors (high blood pressure, high cholesterol) tested in relation to risk of AD
    - Results inconsistent, no patterns by race
  - These factors still important because they affect progression of AD
    - Higher prediagnosis total cholesterol
    - LDL-C concentrations
    - History of diabetes

Purnell C. Alz Dis Assoc Disord, 2009
Diabetes and AD

- Diabetes is a known risk factor for AD, vascular dementia and stroke in total population.
- Diabetes prevalence is higher in most populations of color.
- Some studies of diabetes and dementia show an association in race/ethnic groups, especially in the SALSA study of Mexican American elders.
- Even small changes in elevated serum glucose is associated with delayed recall even before a diagnosis of dementia.

Luschinger JA. 2001 American Journal of Epidemiology
Yaffe K. 2007 JAGS
Obesity/Adiposity

- Obesity is common in many race/ethnic groups
- Midlife obesity associated with 3 fold increased odds of AD in multiethnic cohort at Kaiser Permanente
- Body Mass Index and waist circumference also associated with increased AD incidence in a multi-ethnic sample

Whitmer RA, Current Alz Res 2007
Luschinger JA, J Alz Disease
Education & AD/Dementia

- Low formal education linked to increased risk of dementia in multiple studies worldwide
- Less known about quality of education and risk of AD
  - For education matched AA & W participants lower test scores for AA
  - Literacy possibly better measure of cognitive reserve than education alone
  - Recent data ‘below average’ school performance linked to risk of AD
Education and Literacy Account for Most of the Race Difference in Modified Mini-Mental State Exam Scores

Mehta KM, JAGS 2004
“With age and education controlled, ethno-racial membership loses its association with rates of dementia.”

Gurland et al., National Research Council, 1997
What Accounts for the Power of Education to Explain Variations in Rates of Dementia?

Hypotheses:

- Life long low performance on cognitive tests
- Education is a proxy for other related factors (e.g., poor nutrition, lack of health care)
- Education develops brain reserves
Cognitive Reserve Hypothesis

- Cognitive reserve is the amount your brain cells (neurons) branch when you are young & as you grow.
- Education and other early life experiences may influence the reserve built for each individual.
- In later life, those with higher reserves (i.e., more branches) may have higher cognitive function and less cognitive impairment compared to people with lower reserve.
- Important to ‘use it or lose it’.
What Happens to Minority Patients Once They Have a Diagnosis of AD?

- Some studies suggest earlier onset of dementia (6.8 years earlier in Latinos, in Alzheimer’s Centers in East and West Coast)
- Duration of disease may be longer for minority groups
## African Americans and Latinos Have Longer Survival than Whites at ADC centers

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>% Mortality</th>
<th>Hazard Ratio*</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>African American</td>
<td>30</td>
<td>0.85</td>
<td>0.74-0.96</td>
</tr>
<tr>
<td>Latino</td>
<td>21</td>
<td>0.57</td>
<td>0.46-0.69</td>
</tr>
<tr>
<td>Asian</td>
<td>17</td>
<td>1.06</td>
<td>0.81-1.39</td>
</tr>
<tr>
<td>American Indian</td>
<td>38</td>
<td>1.13</td>
<td>0.91-1.40</td>
</tr>
<tr>
<td>White</td>
<td>41</td>
<td>1.0 (ref)</td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted for Demographics (age as the timescale, gender, educational level, ADC site as a clustering variable, current marital status, living situation), Mini-Mental State Exam Score, and age at first dementia symptom

Mehta KM, 2008 Neurology
Earlier Onset and Longer Survival =

- Increased burden!
- Increased caregiving!
Minority Families May Have Different Information and/or Make Different Decisions

- Overall less NH placement
- Lower rates of Acetylcholinesterase inhibitor use
- Less knowledge about AD
Non-White Participants Less Likely to Report Acetylcholine Esterase Inhibitor Use in California

*Adjusted for: age, education, sex, living arrangement, caregiver, insurance status, medical history of diabetes, hypertension, MMSE Score and functional severity

Mehta, Neurology 2005
Summary

- Some minority populations (African Americans, Caribbean Latinos) show higher rates of dementia compared to Whites.
- Others (Mexican Americans and Japanese Americans) do not.
- Measurement, genetics, cardiovascular risk and cognitive reserve related to length and quality of education may contribute to these differences.
- The overall burden of dementia may be greater for some minority groups.
Clinical Implications for Reducing Disparities

Where do we go from here? What is actionable?

- Strategies
  - Increase knowledge about dementia & its treatment
  - Introduce concepts of prevention through cognitive and physical activity
  - Rigorous management of diabetes and vascular disease
  - With diagnosed individuals, offer acetylcholinesterase inhibitors and reasons for use
Even Modest Delays in Onset Would Result in Big Reductions in Dementia

Resources for Ethnicity and the Dementias

- Alzheimer’s Association initiatives on Inclusion and Diversity
- Alzheimer’s Disease Research Centers (federal and state) with resources for diverse patients and families
- Stanford Geriatric Education Center
  http://sgec.stanford.edu
- *Ethnicity and the Dementias, 2nd Ed.*
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